Thespesia grandiflora (DC.) Urban — Maga

Malvaceae — Mallow family

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John K. Francis

Thespesia grandiflora (DC.) Urban, commonly known as maga, is an attractive, small to medium-sized tree (fig. 1) with dark-green foliage and large, dark pink or red flowers. Although this species produces a valuable wood, its primary value is as an ornamental tree.

HABITAT

Native Range

Maga is endemic to Puerto Rico *(6),* growing at a latitude of 18° N. Originally limited to the moist limestone hills in the north-central and western parts of the Island (fig. 2, *3*), it now grows on most of the Island because of disturbance and widespread planting. Maga is planted as an ornamental in Florida, Hawaii, Honduras, and on several Caribbean islands *(7, 12).*

Climate

Maga will grow in areas where the mean annual precipitation ranges from 1250 to 2500 mm. Its native habitat corresponds to the subtropical moist forest life zone *(4).* The mean annual temperature where maga grows in Puerto Rico ranges from 20 to 27 °C *(2),* and frosts never occur in this area.

Soils and Topography

Maga grows in soils ranging from mildly alkaline to strongly acid, with textures ranging from sandy loams to clays. It prefers well-drained soils, but may be found on somewhat excessively drained and imperfectly drained soils *(14).* Maga is also found in stands growing where there is only a thin veneer of soil over weathered, porous limestone. However, growth is very slow in such conditions. The best trees are found on the colluvial lower slopes of limestone hills and the alluvial bottoms between the hills.

Associated Forest Cover

Forests of the limestone region of Puerto Rico where maga was originally found typically contain the following tree species: *Coccoloba diversifolia* Jacq., *C. pubescens* L., *Licaria salicifolia* (Sw.) Kosterm, *Zanthoxylum martinicense* (Lam.) DC., *Bursera simaruba* (L.) Sarg., *Cedrela odorata* L., *Hyeronima clusioides* (Tul.) Muell.-Arg., *Sapium laurocerasus* Desf., *Ochroma pyramidale* (Cav.) Urban, *Clusia rosea* Jacq., *Bucida buceras* L., *Dipholis salicifolia* (L.) A.DC., *Sideroxylon foetidissimum* Jacq., *Terebraria resinosa* (Vahl) Sprague, and *Homalium racemosum* Jacq. *(7).*

LIFE HISTORY

Reproduction and Early Growth

Flowering and Fruiting.—The flowers of maga are trumpet shaped and about 15 cm wide (fig. 3, *12*). They are deep rose in color, changing to bronzy crimson with age. Although several may be borne per twig, only one flower opens at a time *(7).* Open-grown trees usually begin flowering when they are between 5 and 10 years old. Although it has been reported that maga only produces fruit from September to June *(15),* others have observed that flowering and fruiting occur throughout the year *(14,* author, personal observation). The fruit is smooth and green, subglobose, and 3 to 5 cm in diameter.

Figure 1.—*A maga* (Thespesia grandiflora) *tree growing in Puerto Rico.*

John K. Francis is research forester at the Institute of Tropical Forestry, Southern Forest Experiment Station, USDA Forest Service, Río Piedras, Puerto Rico, in cooperation with the University of Puerto Rico, Río Piedras, Puerto Rico.

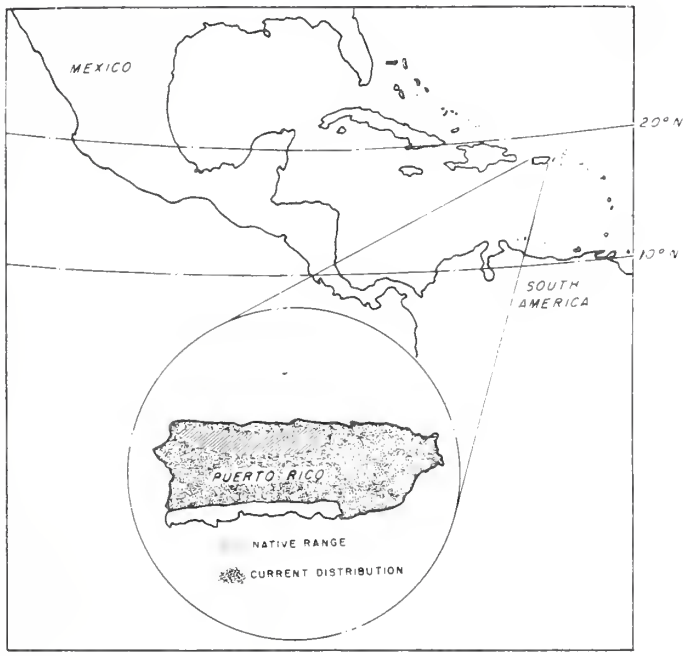

Figure 2.—*Distribution of maga* (Thespesia grandiflora) *in Puerto Rico.*

Figure 3.—*Flowers and leaf of maga* (Thespesia grandiflora).

Seed Production and Dissemination.—Within the white matrix of the pod are embedded 1 to 12 brown seeds. There are 2,551 ±44 fresh seeds per kilogram and 3,940 ±51 air-dried seeds per kilogram (author, personal observation). Others have reported 2,208 seeds per kilogram *(7)* and 3,307 seeds per kilogram *(3)*. The moisture content was not specified for either figure. As seeds mature, the fruit becomes soft and easily separated from the stem. Some fruits fall to the ground, but most are carried away from the tree by birds or bats that drop the seeds after eating the fleshy pericarp.

Seedling Development.—The folded cotyledons are active and green within the seed and begin germinating 5 to 7 days after the fruit ripens. If the seeds are not extracted, the epicotyl will emerge through the wall of the rotting fruit. Seeds germinate epigially. Seeds are obtained for planting by picking ripened pods from trees or from the ground under the trees and shelling by hand. It is best to germinate the seeds immediately, as there can be a reduction in germination with air-dried seeds. Marrero *(8)* reports a 70- to 80-percent germination of fresh seeds, but a reduction to only 20-percent germination after 2 weeks of storage at room temperature. Viability can be extended to nearly 4 months by drying the seeds to 62.5-percent moisture and storing them at temperatures ranging from 1.7 to 4.4 °C.

After the first true leaves emerge, seedlings should be transplanted into individual containers. Wildings are sometimes collected and used instead of nursery germinated seedlings. Seedlings develop rapidly, reaching 20 cm 3 months after planting when grown under 50-percent shade. Containerized stock should be ready to outplant in about 6 months. The seedlings should be given full sun for the last few weeks before moving them to the field. Maga seedlings usually have high survival on good sites *(9)*. They have been successfully bare-root planted, but the container system is recommended.

Vegetative Reproduction.—Maga saplings and poles coppice readily. Larger trees may also coppice. Old trees often produce a profusion of basal sprouts and epicormic branches. Maga can also be regenerated from woody cuttings *(14)*.

Sapling and Pole Stage to Maturity

Growth and Yield.—Height growth in several Puerto Rican plantations averaged about 1 m per year for the first 10 years and decreased thereafter. Maga trees usually do not reach heights of more than 20 m. Plantation trees increase in diameter at about 0.9 cm/yr for a few years and slow down thereafter. Trees in a natural stand slowed from 0.5 cm/yr to 0.1 cm/yr over a period of 25 years *(15)*. In one small plantation on the Río Abajo forest of Puerto Rico, basal area seemed to level off at about 14 m^2/ha. A final diameter at breast height (d.b.h.) of 15 to 45 cm can be expected; the larger sizes are found most often with open-grown trees. Dominant trees in one Puerto Rican plantation had reached an average d.b.h. of 17 cm d.b.h. by 21 years. Commercial sawlogs on favorable sites might be produced in 35 to 50 years. Maga does not appear to be a long-lived species. The production of sawlogs in the natural forest is apparently a fortuitous event. This is

attested to by the fact that maga wood has never been available in large quantities *(16)*.

Rooting Habit.—Maga seedlings produce a strong, fleshy taproot. It is not known if the taproot persists in larger trees. Lateral roots do not appear to raise or break sidewalks and curbs.

Reaction to Competition.—Although nearly 400,000 seedlings of maga were planted in the Caribbean National Forest between 1934 and 1945 *(9)*, relatively few still survive, and those reaching small sawlog size have been rare. Their relatively slow growth has allowed more aggressive species to overtop and shade the plantation trees. Maga is intolerant of shade and cannot survive for long in a dark understory. It frequently persists, however, in intermediate positions in the forests of the limestone hills. Maga reproduction benefits from disturbance, and the species grows particularly well along roadsides. Unless growing in closed stands on good sites, maga trees form wide crowns and often lean over. Because they produce many epicormic branches and basal sprouts, pruning does not help much *(9)*. Small sizes and relatively slow growth suggest that maga should not be considered in planting programs that have the production of sawlogs as a primary objective. The species should be managed, however, as a valuable and aesthetic minor species when it is present in natural stands.

Damaging Agents.—Several minor pest and disease problems have been reported for maga. One is the pink bollworm *(Pectinsphora gossypiella* Saunders); this is a major pest of cotton that will also feed on the pods of maga and thus is able to sustain itself when cotton balls are not available *(16)*. Because cotton is no longer grown commercially in Puerto Rico, maga no longer functions as the undesirable alternate host. The homopteran *Asterolecanium pustulans* (Cockerell) causes some defoliation and the death of many twigs and smaller branches *(11)*. Twenty-two other insects have been observed feeding on maga, but none have caused serious damage. The phenol, gossypol, identified from maga wood and bark *(5)*, and which certainly must also be present in the leaves, interferes with biological pathways *(13)* and may be a deterrent to many insects. On unfavorable sites, a high incidence of leaf spot (necrotic spots on leaves) can occur *(10)*. Plantations in the Luquillo Mountains of Puerto Rico were attacked by mice that ate the pith of many seedlings *(3)*. Maga heartwood is listed as immune or very highly resistant to the West Indies dry-wood termite, *Cryptotermes brevis* Walker *(17)*. Maga wood is referred to as very durable *(7)*, indicating rot resistance.

SPECIAL USES

The sapwood of maga is light brown, and the heartwood is a rich chocolate brown, reminiscent of old-growth mahogany *(7)*. When available, it is more desirable than mahogany and sells for a higher price. Maga is now mainly used for musical instruments and crafts, but is occasionally used in furniture and interior trim *(7)*. Small stems are used as posts.

The principle value of maga is as an ornamental. This broadleaf evergreen tree fills a convenient niche between large shrubs and shade trees. Its dark green foliage and constantly renewing flowers have made it a favorite in Puerto Rico and elsewhere.

GENETICS

Thespesia contains about 10 species *(1)*, all of which are tropical. Botanic synonyms are *Montezuma speciocissima* Sessé and Moc., *M. glandiflora* DC., and *Maga glandiflora* (DC.) Urban. *(6)*.

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